Wood or Coal Furnaces

Models 360EK and 480EK

Installation, Operation & Maintenance Manual

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Energy King Wood/Coal Furnaces
Installation and Operating Instructions
Models 480EK and 360EK

BEFORE INSTALLING YOUR ENERGY KING FURNACE, PLEASE READ ALL OF THE OWNER'S MANUAL AND SAFETY NOTES. PLEASE SAVE THIS MANUAL FOR FUTURE REFERENCE.

Congratulations on your purchase of an Energy King solid fuel heating appliance. Your Furnace is designed for a lifetime of durable, reliable performance and easy operation. This manual describes the installation, operation and maintenance of your Energy King Wood or Coal Furnace.

Energy King's Furnace has been designed to use independently or as an add-on to an existing heating system. The installation of any furnace **is not** a do-it-yourself project. To ensure the Furnace will operate safely and efficiently, the **installation must be performed by a qualified installer.** With proper installation and maintenance, your Furnace will give you years of trouble free service. Energy King's Furnace is designed to burn Air-Dried Hardwood, Anthracite or Bituminous Coal.

If your Furnace is not properly installed, a house fire may result. For your safety, follow the manufacturer's installation instructions. This Furnace maintains high temperatures when in use. Keep combustible materials – such as clothing, paper, and furnishings – clear of the Furnace. Warn children of the Furnace's high temperature.

This Furnace is in compliance with UL 391 test standards.

Prior to installation, inspect your chimney to ensure it is in good condition and free of cracks. Contact local building and fire officials regarding restrictions and installation inspection requirements for your area. You also need to determine if you are required to obtain a permit from your local governing authority.

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Safety Notes – Important

There are inherent hazards associated with the operation of Wood/Coal Furnaces. ***For your safety, please read, understand and heed the following cautions.*** Failure to heed may result in serious personal injury or death.

1. Do not burn garbage, gasoline, drain oil, or other flammable liquids.

2. Never use chemicals or fluids such as gasoline, charcoal lighter fluid, drain oil, fuel oil or kerosene to start or "freshen" a fire in your furnace. Keep such liquids away from your furnace.

3. Do not operate with fuel loading or ash doors open.

4. The loading door, ash door and exposed firebox are extremely hot during operation. Never touch these parts when hot. Warn children of the furnace's high temperature.

5. Do not store fuel or other combustible material within marked installation clearances.

6. Comply with all minimum clearances to combustibles as they appear in this manual to prevent fire.

7. All fuel-burning appliances require proper combustion air to operate and to avoid negative air pressure in your home. Negative air pressure will cause safety and operation problems.

8. Do not connect your solid fuel appliance to a chimney flue already venting another appliance.

9. Do not let an accumulation of either soot or creosote build up in your chimney or inside the firebox. Inspect and clean flues, chimney and firebox regularly.

10. Dispose of ashes with care. Never use anything but an airtight metal container to store your ashes in. Ash can must be placed on a non-combustible surface. (See page 16 of this manual for further information.)

11. Use caution when opening loading door. Wait 10 seconds on first latch before refueling. Opening loading door rapidly can cause a flame to flash out the door.

12. Never burn wet or green wood. Store all wood in a dry location away from the elements.

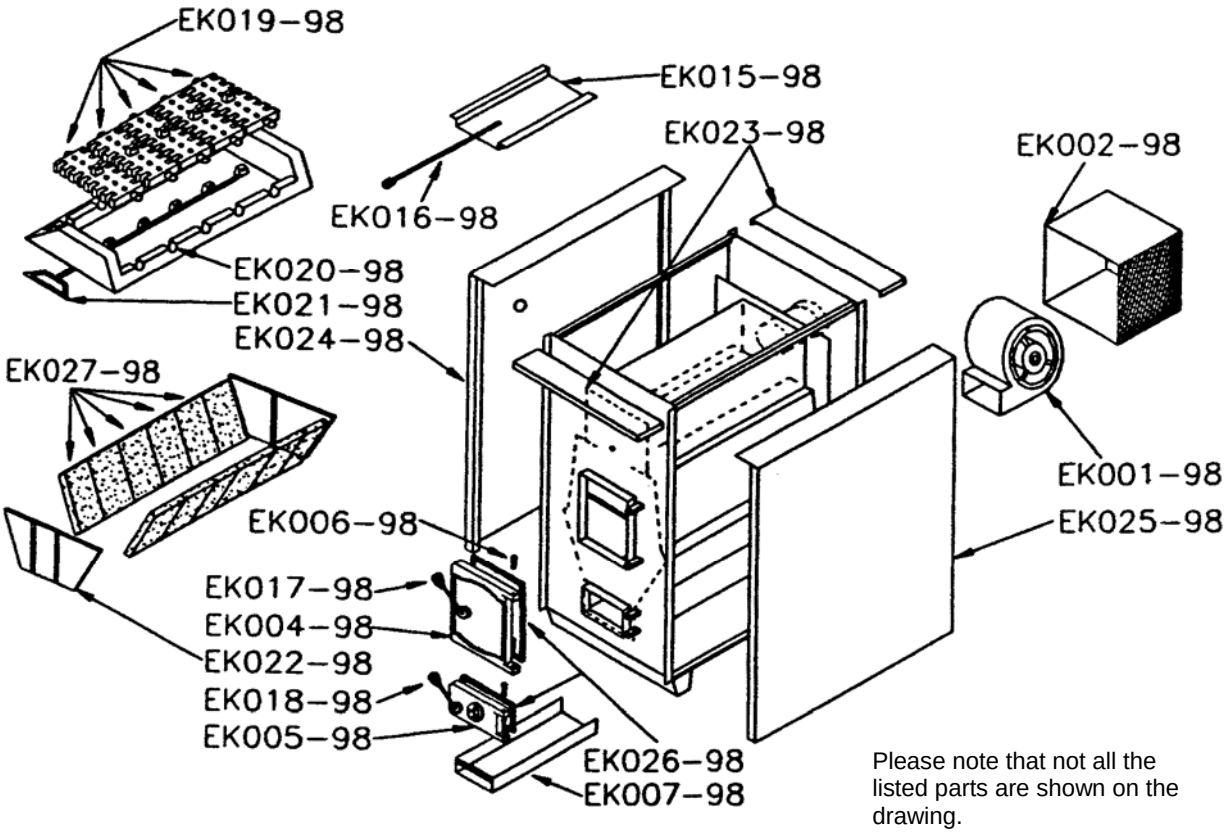
13. Do not load coal above top of firebrick.

14. Disconnect appliance from electrical supply before servicing unit.

15. Equipment must be installed by a qualified heating person. Only "Class A" all-fuel or solid fuel chimneys intended for use with your Energy King should be used. Check your chimney system carefully before installation. If in doubt about its condition, contact a professional.

16. The furnace must be installed on a non-combustible floor or 3/8″ thick fireproof millboard or equivalent.

Parts List



Please note that not all the listed parts are shown on the drawing.

PART NO. AND DESCRIPTION

EK001-98	Circulation Blower: Sub-assembly
EK002-98	Filter Box: Sub-assembly
EK003-98	Wiring Harness: Sub-assembly
EK004-98	Cast Iron Feed Door
EK005-98	Cast Iron Ash Door
EK006-98	Door Hinge Pins – 4
EK007-98	Ash Pan (removable)
EK008-98	Self-Tapping Bolts – 3
EK009-98	¼″ x ¾″ Bolts – 8
EK010-98	¼″ Nuts – 4
EK011-98	¼″ Washers – 4
EK012-98	Fan Housing Mounts
EK013-98	½″ Jam Nut
EK014-98	½″ Acorn Nut
EK015-98	Sliding Smoke Baffle
EK016-98	Slider Rod
EK017-98	5/8″ Spring Handle
EK018-98	½″ Spring Handle
EK019-98	Shaker Grate Bars 480EK → Quantity 5 360EK → Quantity 4
EK020-98	Shaker Grate Frames – 2
EK021-98	Shaker Grate Handle
EK022-98	Cast Iron Hearth End Plates – 2
EK023-98	Shroud, Top
EK024-98	Shroud, Left Side
EK025-98	Shroud, Right Side
EK026-98	Door Seal Rope Kit
EK027-98	Firebrick, 1 ¼″ x 4 ½″ x 9″ 480EK → Quantity 12 360EK → Quantity 10
EK028-98	Wood Grate
EK029-98	480EK Shaker Grate Bar Connector
EK030-98	Shaker Grate Control Handle
EK031-98	360EK Shaker Grate Bar Connector

Installation

Specifications

Model Number	480EK	360EK
H x W x D	51.5″ x 26″ x 60″	48″ x 26″ x 53″
Shipping Weight (approx.)	650 lbs.	530 lbs.
BTU Capacity (approx.)	160,000	125,000
Blower Capacity 3 Speed	1400-1600-1850	1400-1600-1850
Log Length	26″	21″
Coal Capacity	190 lbs	130 lbs
Fire Chamber Capacity	9 Cu. Ft	6.3 Cu. Ft
Loading Door Size	13.5″ x 15.5″	13.5″ x 15.5″
Ash Door Size	7.25″ x 11.5″	7.25″ x 11.5″
Flue Size	6″	6″
Flue Collar Height	48.25″	45″
Plenum Outlet Size	20″ x 20″	18″ x 18″
Efficiency (approx.)	78%	69%
Leg Height	3.5″	3.5″
Combustion Air Diverter Wood or Coal	Standard	Standard
Filter Box Left or Right Inlet	Optional	Optional
Draft Controls Forced Draft Thermostatically Controlled Automatic Draft Thermostatically Controlled Manual Draft Control	Choice Choice N/A	N/A Optional Standard
Secondary Heat Exchanger	Standard	Standard
Insulated Cabinet	Standard	Standard
Shaker Grates	Optional	Optional
Wood Grates	Standard	Standard
Cast Iron Hearth Plates Front and Rear	Standard	Standard
Prewired Electrical Components	Standard	Standard
Double Wall Back	Standard	No
Removable Ash Pan	Standard	Standard
Warranty	6 Year Prorated	6 Year Prorated
Complies with Test Standards	UL391	UL391

General Requirements

The installation of any solid fuel heating appliance is not a do-it-yourself project. The Energy King should be installed by a qualified heating specialist. Check with your fire department and building inspector for local, state and federal codes regulating installation. Wood or coal related fires are caused almost exclusively by installation, operation or maintenance errors.

Only type HT or Residential type masonry chimneys intended for use with your Energy King should be used.

Do not connect this unit to a chimney flue serving another appliance.

The Energy King is to be used in conjunction with a listed gas or oil fired furnace or as a central furnace.

Electrical supply:

115 volts, 60HZ, 1 phase, 15 amps.
Install system with 0.2 static pressure.
Flue setting .06 in of W.C. minimum.

Smoke detectors in “working” condition should be a part of every Energy King furnace installation. This is the most inexpensive insurance you can buy.

Placement – Minimum Clearances

The furnace must be installed on a non-combustible floor or 3/8 inch thick fireproof millboard or equivalent. The non-combustible material must extend at least 8 inches from the sides and rear of the unit and 24 inches in front of the unit.

One very important step in positioning your wood/coal furnace is the distance from your new or existing chimney. The unit should be installed as close to the chimney as possible with a minimum of elbows (no more than two) and a run of no more than 6 feet horizontally maintaining a ½ inch rise per linear foot.

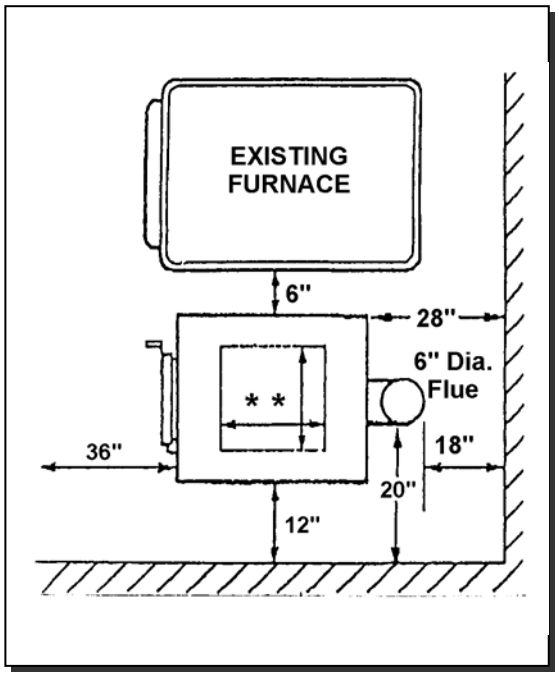
Stovepipe must have a minimum of 18 inches from the rear and 20 inches from the sides of the unit to combustibles.

The furnace must have clearances of 12 inches from the sides of the unit. Leave a minimum clearance of 36 inches in front of your unit. This is for safe, easy loading and cleaning of your unit. The minimum clearance to combustibles to the rear of the unit is 28 inches.

If using your unit as an add-on, a 6-inch minimum clearance is required between the Energy King furnace and your existing furnace.

Plenum clearances to combustibles – 2 inches.

Caution: Plenum must be installed in accordance with NFPA 90-B, 1993, 2-1.3.



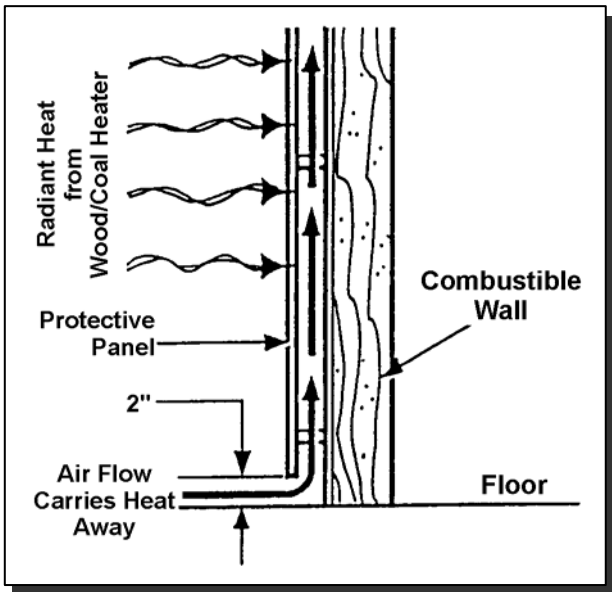
**Plenum 20″ x 20″ → 480EK Furnace

**Plenum 18″ x 18″ → 360EK Furnace

Reduced Clearances

NPFA guidelines and most codes permit reduced clearances to combustible walls and ceilings if adequate protection is added. A common mistake is to assume that sheet metal, masonry, or asbestos board placed directly against a wall protects it. Materials installed in this manner give very little protection. These materials are good heat conductors, so they will be almost as hot on their backside as on the exposed side. Therefore, the combustible wall behind is still a fire hazard.

A wall can be kept cool using these items, but only if they are mounted spaced out from the wall by an inch or two to allow free circulation of room air behind the protective panel. Circulating air keeps the wall cool by carrying the heat from the space between the wall and panel. The protective panel should start within a few inches of floor level.



The three rules to follow when constructing wall protectors are as follows:

1. Non-combustibility of all materials including mounting or supporting system.

2. A well ventilated air space between the protector and the wall.

3. Sufficient strength and rigidity so that the protector and air space will be durable.

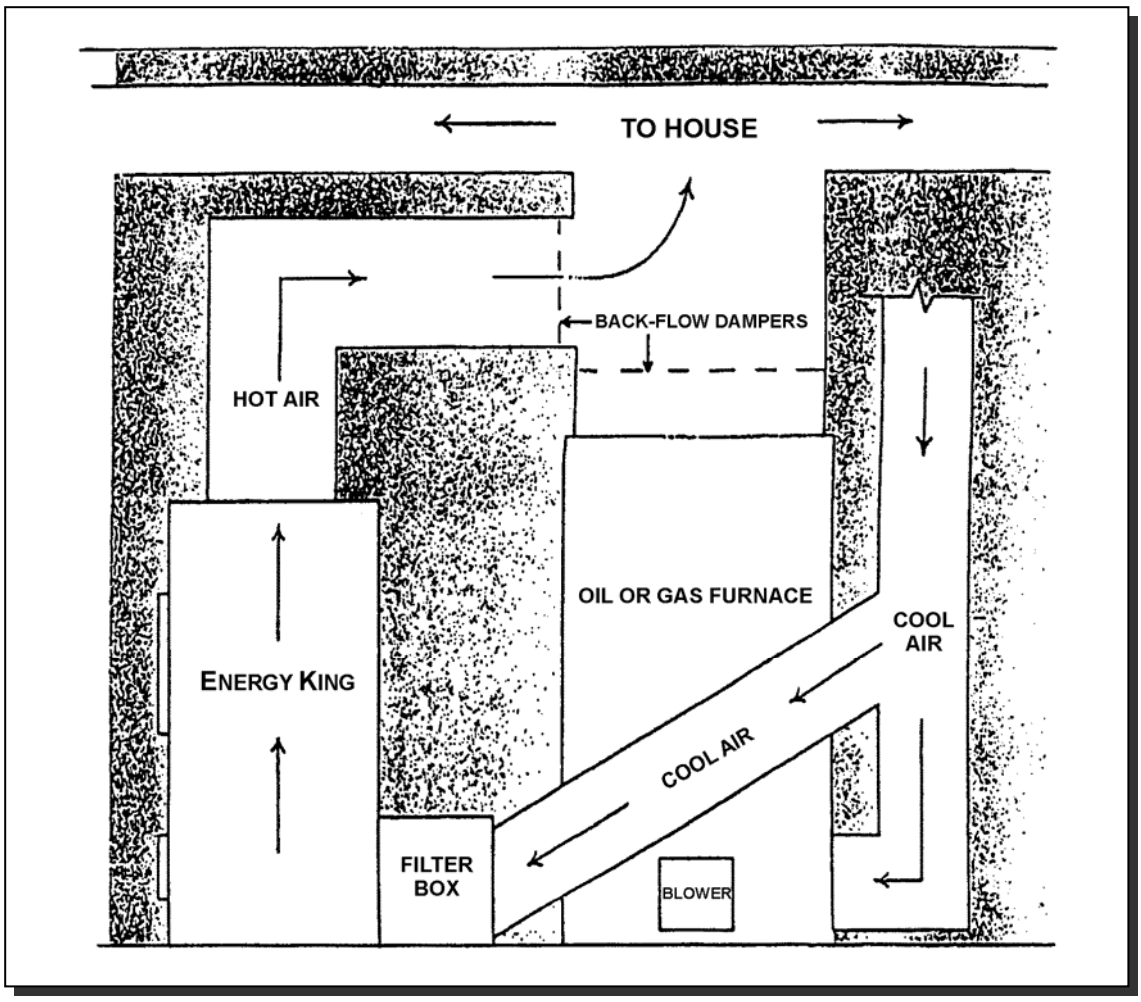
Add-On Installation

Before installing your Energy King furnace, consult your heating contractor and your local and state building codes to determine if your furnace will accept an add-on application. Some small furnaces and especially counterflow furnaces may not be used in an add-on installation.

The CFM capabilities between the blower on the existing unit and the supplemental unit must be compatible.

If all these conditions are met, then the combined static pressure may not exceed that established by the existing furnace.

Once it has been determined that your existing furnace will accept an add-on installation, we recommend a parallel installation, with a direct (ducted) feed of return air to the Energy King furnace. The two backflow dampers ensure that when either unit is operating by itself the hot air will flow into the home, and not flow back through the other furnace.



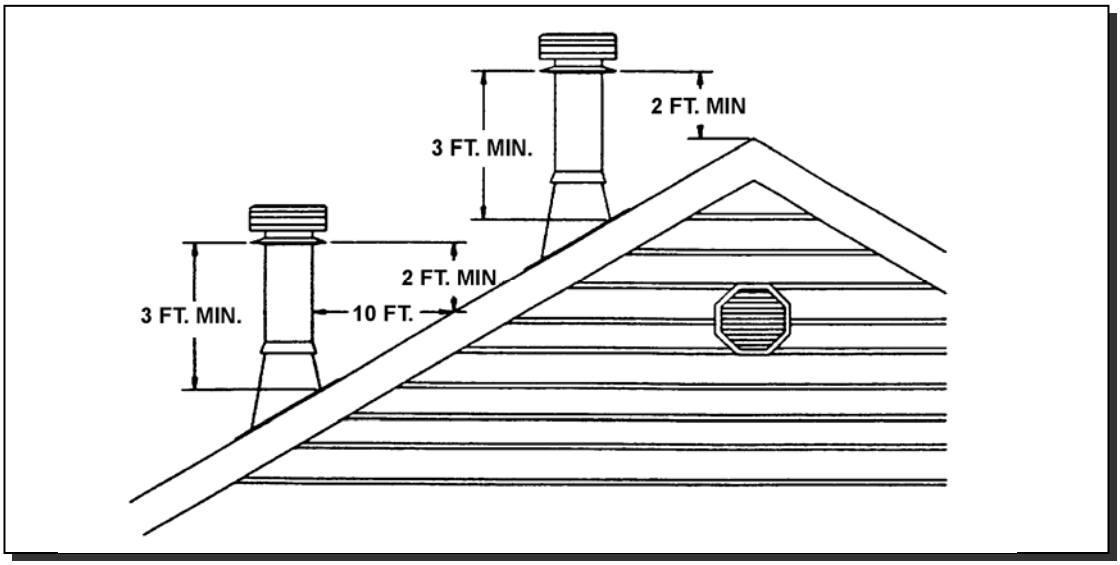
MOST COMMON ADD-ON ARRANGEMENT

Chimney

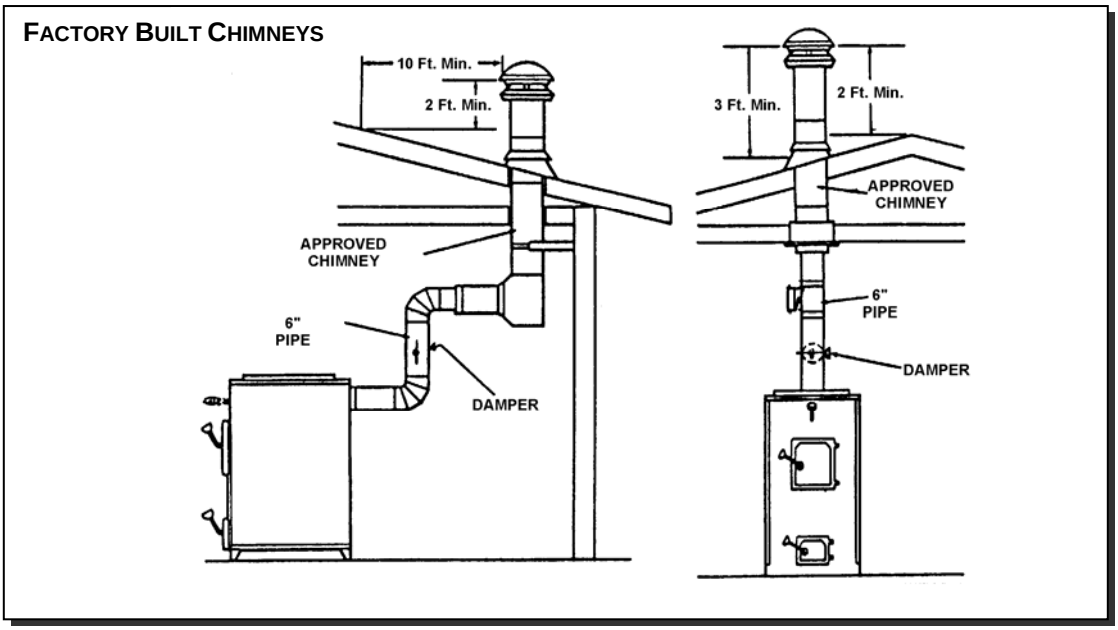
The Energy King requires installation into an all-fuel or a class “A” chimney only. Do not connect the Energy King to any chimney flue servicing any other heating appliance, as recommended by the National Fire Prevention Association. The chimney draft should then be adjusted to .06 inch water column.

All chimney connections must meet the approval of the local building inspector and fire marshall and conform to all local, state and national codes.

It is also necessary to clean your chimney of creosote or other causes of blockage periodically to insure safe and trouble free heating.



The chimney must extend not less than 3 feet above the highest point where it passes through the roof of a building and not less than 2 feet above any portion of the building within 10 feet.



Unit Assembly

1. Remove the protective plastic coating from the cabinetry of the unit.

2. ***Cast Iron End Plates.*** Position front and rear cast iron end plates in firebox. The type of fuel (wood or coal) you primarily burn will determine how to locate the end plates.

   The words, “Wood” and “Coal,” are cast into the end plate on opposite sides. If you are going to burn wood, position end plate with the word, “Wood,” facing out, not into the firebox. If you are going to primarily burn coal, position end plate with the word, “Coal,” facing out. The purpose of proper location is to introduce the precise amount of combustion air into the firebox to promote the most efficient combustion for either fuel.

3. ***Firebrick.*** Position 6 firebricks for Model 480EK, or 5 firebricks for Model 360EK, standing up on end on the left and right side.

4. ***Control Box.*** Mount the 3-speed switch control box on lower left side of furnace. Four holes are pre-punched.

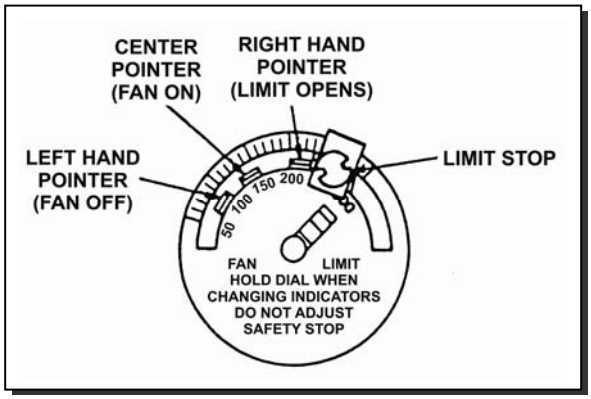
5. ***Fan Limit Control.*** Remove the cover of the fan limit control by grasping the cover at the top and bottom and pull outward. (Grasping the cover by its side will make removal more difficult.)

   Attach the control directly above the control box into the pre-punched holes using the screws provided.

   Normal fan limit settings are
   140º ON
   95º OFF
   For adjustment of these settings, see drawing.

   Set Pointers. Hold dial securely with one hand and move the pointers with the other hand. Do not force the pointers past any stops on the dial even though the dial may be graduated beyond the stops.

   Limit. Move the right hand pointer so that its straight edge indicates the temperature at which the contacts should open. The limit pointer should never be set any higher than the setting recommended by the furnace manufacturer.



   Fan. Move the “Fan On” pointer so that its straight edge indicates the temperature at which the fan contacts should close to start the blower. Move the “Fan Off” pointer so that its straight edge indicates the temperature at which the fan contacts should open to stop the blower.

6. ***Draft Blower or Tube.*** Mount forced draft blower or natural draft tube on front lower left side of ash pit door.

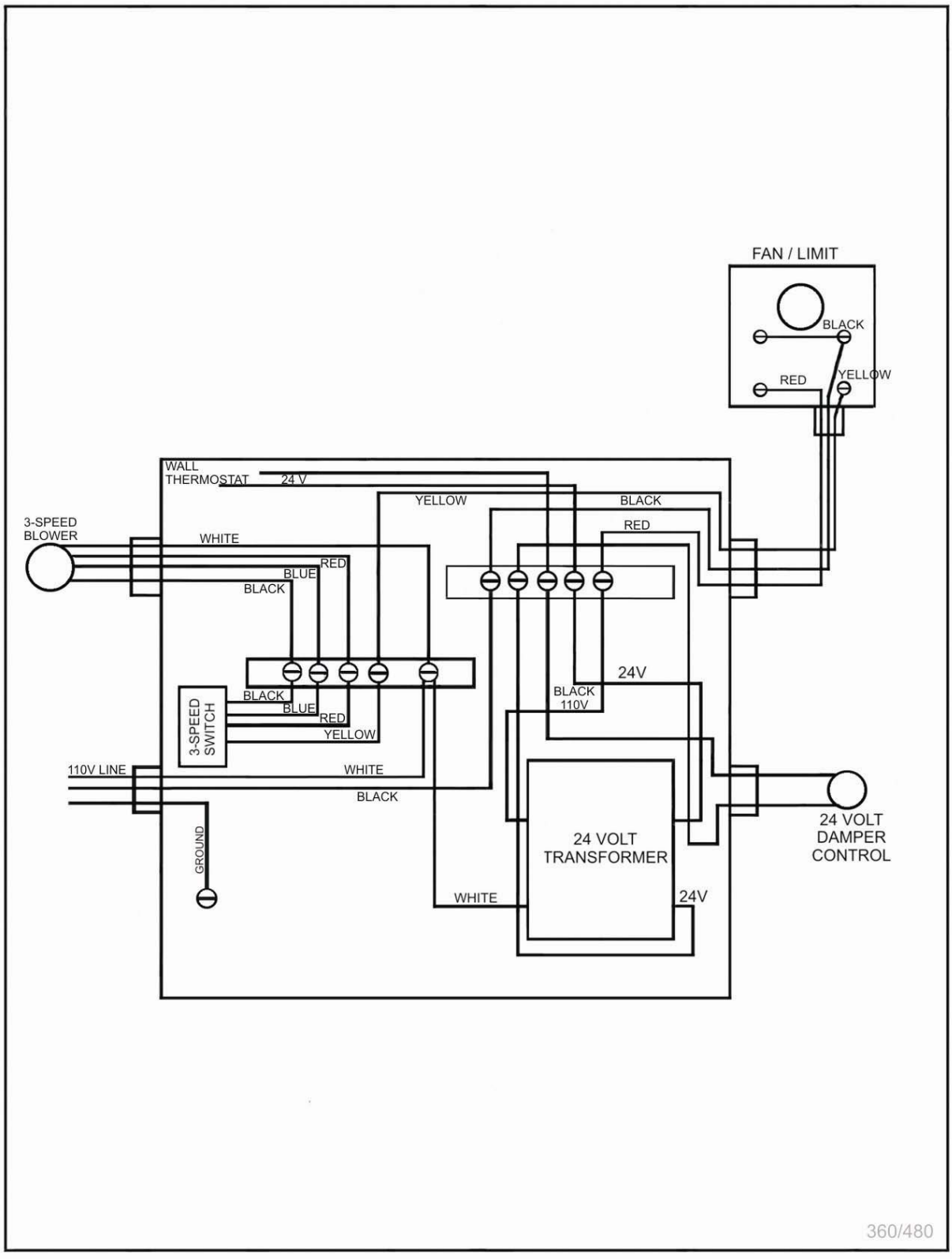
7. ***Circulation Blower.*** Mount circulation blower on rear of the furnace using the four bolts supplied.

8. ***Return Air.*** Determine whether your return air will enter on the left or right side of the furnace. Assemble the optional filter box and mount on furnace (see Assembly Schematic on page 11).

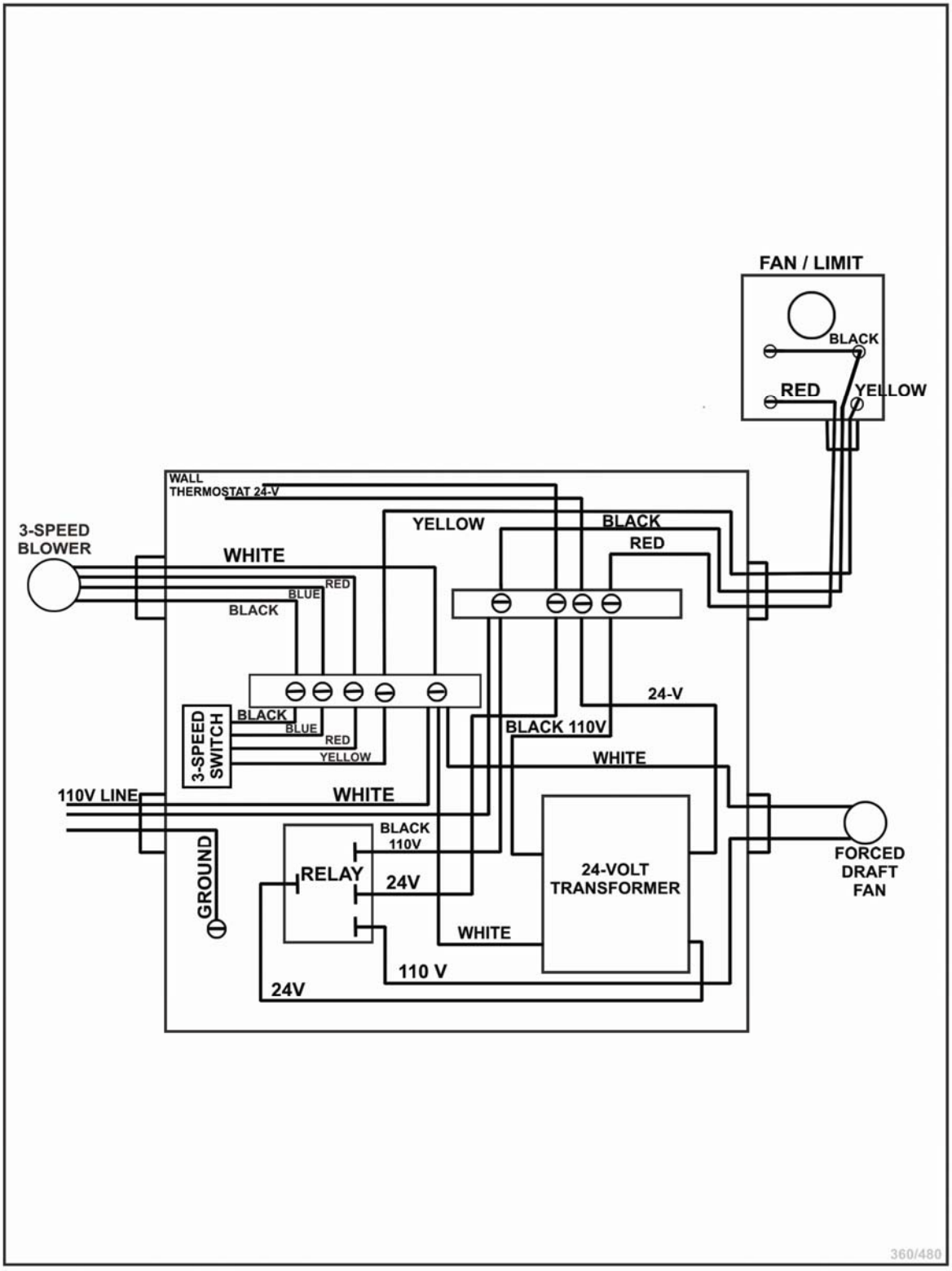
9. ***Wiring.*** Your Energy King is all pre-wired except for the circulation blower on the rear of your furnace. Once the blower and filter box are mounted on your furnace, simply run conduit through the hole on the filter box. Next, wire the four lead wires onto the four spade connectors in the junction box by matching colors of wire and following the applicable wiring diagram.

   Black → High Speed
   Blue → Medium Speed
   Red → Low Speed
   White → Neutral

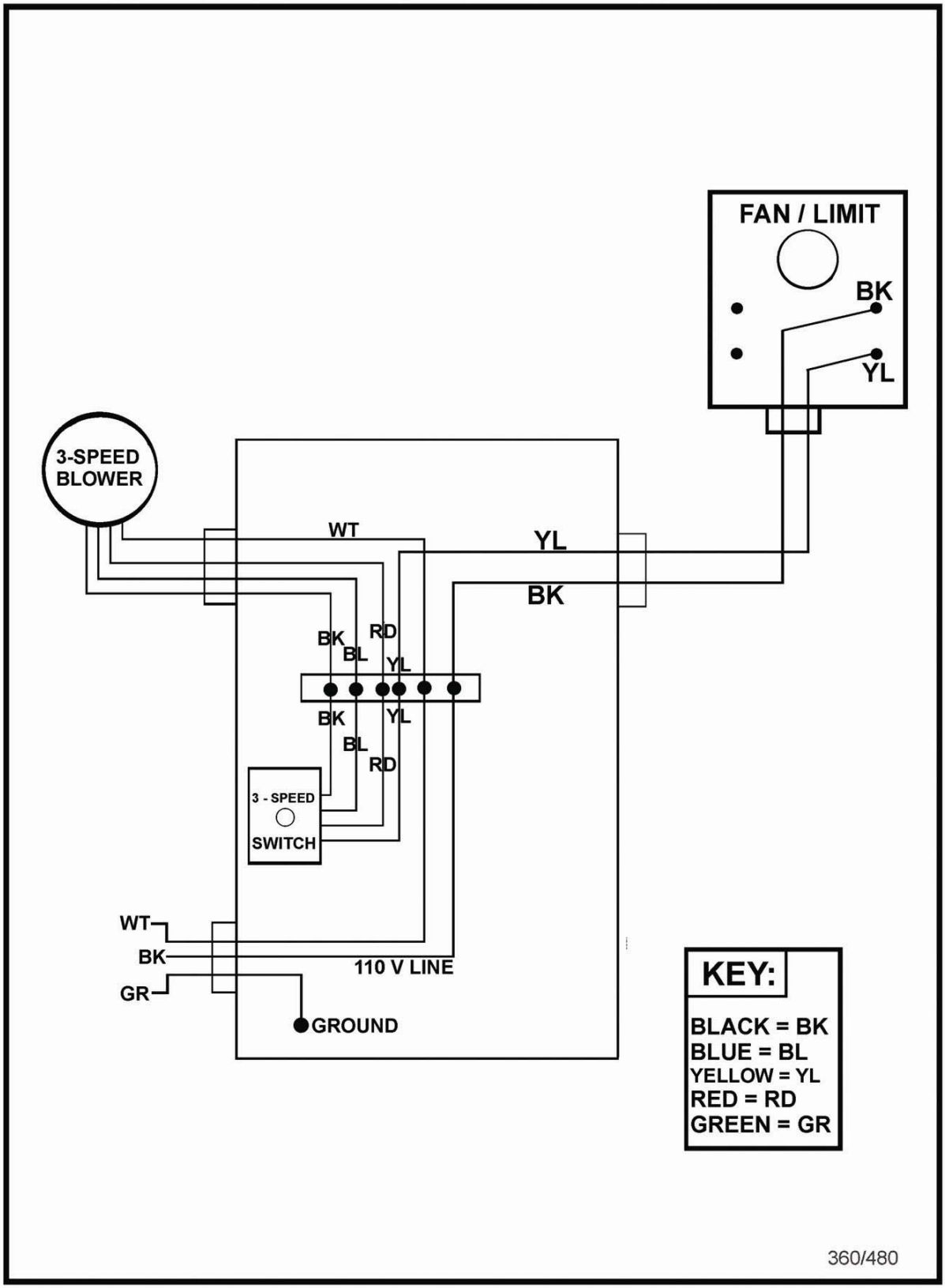
Wiring Diagram – Auto Draft



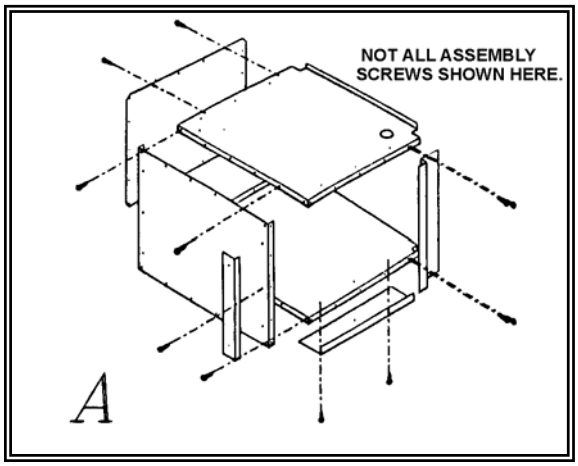
WIRING DIAGRAM - FORCED DRAFT



Wiring Diagram – Manual Draft

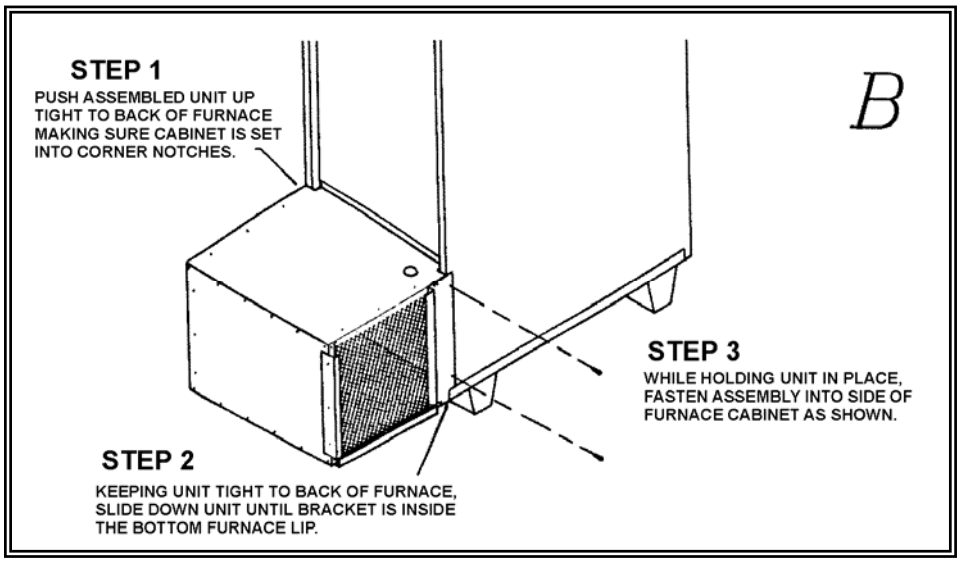


Filter Box Assembly Schematic

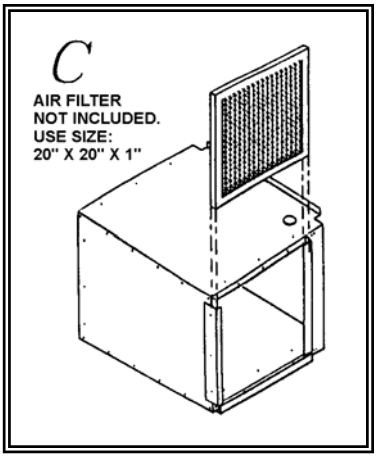


CAUTION

THE FILTER MUST BE REMOVED IF THE FAN IS INOPERABLE FOR ANY REASON. THIS WILL PREVENT OVERHEATING OF THE MOTOR.



THE AIR FILTER MUST BE NON-COMBUSTIBLE.



Stovepipe Installation

Install your wood/coal unit as close to the chimney as possible with a minimum of elbows (no more than two are recommended) and a run of no more than 6 feet horizontally. The pipe should maintain a ½ inch rise per linear foot and ***never*** be installed closer than 18 inches from combustibles. Exceeding these recommendations normally results in creosote buildup, a smoking furnace or one with a poor draft.

When connecting stovepipe, all joints should be secured with at least three sheet metal screws. If it is absolutely necessary to have a run of more than 6 feet (which is not recommended), use extra support hangers or brackets every 3 feet.

The connection to the wood burner's collar must also be more than just a snug fit and secured with sheet metal screws. Mark each connection for cleaning. This will prevent frustration when matching up your hole pattern again.

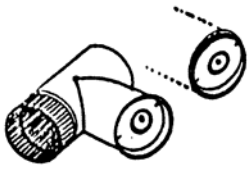
Dampers in Stovepipes. Put a manual damper at a safe, convenient place between the chimney and your Energy King furnace. In case of a chimney fire, it can quickly be closed reducing draft to the chimney. Keep the manual damper completely open during normal operation.

When burning coal, a Barometric Draft Damper must be installed at a safe, convenient place between the chimney and your Energy King. Setting at .06″ W.C.

Barometric Draft Installation

Some codes and the NFPA require draft regulators in the chimney connector of wood or coal furnaces and boilers.

Draft regulators limit the draft (the suction pulling air into the appliance). A pivoted, counterbalanced flap is pulled open by the draft when the draft reaches a critical amount. This permits air to enter the chimney, thus preventing the draft in the appliance from rising any higher.



With no draft in chimney, regulator is closed, no air gets in.

Moderate suction in chimney pulls regulator open enough to maintain desired draft for appliance.

Excessive suction in chimney pulls regulator further open, allowing substantial air into chimney connector.

Air Duct Installation

The ducts, fittings and registers should be sized so that the total external static pressure does not exceed 0.2.

The plenum on the Energy King 480EK should be 20″ x 20″ and on the Energy King 360EK the plenum should be 18″ x 18″. The plenum should be no closer than 2 inches from the ceiling or any combustible material. In a power outage situation, excessive heat buildup in the plenum top may be dangerous; so make sure clearances are maintained. **NEVER** supply less than 150-square inches of constant heated air outlet area.

CAUTION

DO NOT INSTALL THE ENERGY KING WARM AIR SUPPLY INTO THE COLD AIR RETURN OF THE CENTRAL FURNACE. THE COMPONENTS OF THE CENTRAL AIR FURNACE COULD OVERHEAT.

Cold air returns must be equal in size to the heated air outlets and preferably 10% larger. Every Energy King furnace **MUST** be installed with a cold air return.

Operation

General Instructions

Please read the following before firing your furnace. It is very important that you follow these suggestions and limitations in order to maintain your warranty and to guarantee the long life of your furnace.

This furnace is an airtight unit designed to burn 6 to 8 hours per load of wood or coal. If the furnace is being fired hot constantly with full flames and operating at only a 2 to 4 hour burn cycle, ***it is being overfired.*** Your home heating needs may be too great for the size of furnace you have purchased.

Sometimes you need to allow your existing furnace to assist you in colder weather. Your automobile engine works effectively at 55 mph, but can be damaged or destroyed at constant speeds of 90 mph. Your furnace can be damaged if it is constantly fired at extremely high temperatures. Forced firing or abuse can be detected upon inspection, ***and will void your warranty.***

CAUTION

PLEASE HEED THE FOLLOWING CAUTIONS WHEN OPERATING YOUR ENERGY KING FURNACE:

- NEVER STAND IN FRONT OF THE LOADING DOOR WHEN OPENING IT. STAND TO THE SIDE OF THE DOOR.
- NEVER OPERATE THE UNIT WITH THE ASH DOOR OPEN.
- USE CAUTION WHEN OPENING THE LOADING DOOR. AVOID OPENING THE LOADING DOOR RAPIDLY AS THIS CAN CAUSE A FLAME TO FLASH OUT THE DOOR. THIS OCCURS WHEN THERE IS UNBURNT FUEL AND A LARGE AMOUNT OF GASES ON TOP OF THE FIREBOX. WHEN THE DOOR IS OPENED RAPIDLY, OXYGEN COMBINES WITH THE GASES AND IGNITES.

Check Blower Operation. Check to make sure that your main blowers, or blower and draft blower, are in proper working order before lighting a fire.

- To check the main blowers, use the manual switch on the fan limit control.
- To ensure the draft blower is working properly, turn the thermostat upstairs to a high temperature to turn the draft blower on. Check to make sure your draft blower is working and then set the thermostat to the desired setting.

IMPORTANT

IN THE EVENT OF A POWER FAILURE –

1. CLOSE DRAFT DIAL ON ASH DOOR.
2. REMOVE AIR FILTER (IF APPLICABLE).
3. OPEN ALL HEAT REGISTERS
4. ONLY LOAD THE UNIT HALF FULL.
5. KEEP BYPASS DAMPER CLOSED.

First Fire. The first fire in your Energy King should be a small one. The unit may smoke for a few minutes and there may be an odor during the first firing as the paint and new steel cure. Do not fully load your furnace or open all draft controls completely until you become familiar with the operation of your furnace.

Manual Draft. The manual draft controls the burn rate of your Energy King furnace. When the manual draft is turned to the left, it will burn at a higher rate. Turning the dial to the right sets the burn rate to a slower burn. The draft dial can be set to any position between high and low to achieve the desired rate of burn for your home. The chimney, hookups and kind of wood used will also be factors in determining the proper setting for your home.

Burning Wood

Burning wood can be fun as well as economical if you are willing to expend the personal energy required to reduce your fuel dollar. More than any other major fuel, wood provides us with independence – a source of heat that we can rely on. Unlike fossil fuels, wood is a renewable source of fuel when harvested properly. When mature trees are replaced with young trees, our forests and woodlands can continue to supply an excellent source of energy.

The most common unit of measure for wood is the standard cord – a stacked pile of wood that measures 4′ x 4′ x 8′. One of the most important characteristics in selecting wood is the energy content per cord. The more weight in a cord of wood, the more heat it can provide.

It is important to use air-dried wood. Although all wood has some moisture content, the drier the wood the better the burn. Different wood certainly burns with different characteristics. Because some woods are denser than others, the amount of available energy per cord will vary drastically. Dense woods, such as hardwoods, burn for a longer time than lighter woods, such as softwoods. Be sure you know the type of wood and the moisture content before you buy.

Your Energy King is capable of holding very large logs. ***Do not*** try to add a log that is larger than what you can easily place in the furnace. You will get the best efficiency when you add only the amount of wood needed for an 8 to 10 hour burn.

Starting a Wood Fire

1. Pull the bypass damper (located above the feed door) out.

2. Place a small amount of crumpled paper in the center of your Energy King. Crisscross a couple of handfuls of dry, ¾″ thick kindling wood, then several small pieces of firewood.

   Be sure the bypass damper is open.

3. It will take 5 to 10 minutes for the fire to establish itself. Once you have some red-hot burning embers, add larger pieces of wood. All home chimneys and hookups are different. After a few fires, you will find the best way to start a fire in your unit.

4. Push in the bypass damper after loading your Energy King.

5. On airtight units, the burning time is controlled totally by the draft controls on the furnace.

6. To refuel your Energy King, pull the bypass damper out. Open the door slowly and rake the red-hot embers over the grates evenly. Put a few smaller pieces of wood on the coals first, and then load the furnace with larger pieces of wood. (A full load is not always the best solution for your needs.) Close the door and bypass damper.

Burning Coal

Burning coal will provide a lesson in patience. Take the time necessary to experiment and understand the operation of your Energy King furnace. Please keep the following points in mind when burning coal:

1. A barometric draft control in the smoke pipe must be used when burning coal.

2. ***Never*** completely cover the live fire with fresh coal. Always leave a generous area of burning coal at the top and rear of the fire.

3. Always keep the ash pit clean. Coal firing produces much more ash than wood. These ashes must be removed often (possibly daily) in order to avoid piling up too closely to the grates. Removal of the coal ash will allow for passage of primary air to the coal bed and prevent damage or warpage to the grates.

   Ash should always be put into an airtight metal container that is placed on a non-combustible surface. All coal contains small amounts of dangerous elements. Therefore, it is essential that your coal

ash be disposed of in municipally designated areas.

4. Too much draft air will cause clinkering of coal and will waste heat up the chimney. Shut the draft down to as low a point as you can and still heat your home.

5. A coal fire should not be poked or broken up, as this tends to bring ash to the surface of the coal bed where it may fuse. If the ash fuses, clinkers will form. It may be necessary to remove all unburned material and ash from the firebox to remove the clinkers. These should be carefully removed using tongs, and as always, put into a metallic airtight container.

6. If the fire goes out or does not hold overnight, check for the following:

    a) Poor draft.
    b) Incorrect damper settings.
    c) Improper firing methods for the coal being used.
    d) Coal is not sized to the furnace.
    e) Ashes, if allowed to accumulate in the ash pit, will not allow the passage of required air for combustion. Keep ash pit clean.

Starting a Coal Fire

1. Open the bypass damper (located above the fuel door) by pulling out.

2. Build a fire using crumpled paper and a small amount of dry kindling wood. Wait until the wood fire is established before adding coal.

3. Add several small shovels of coal over the wood coals.

    Never overload your firebox. Coal should not cover the firebrick.

4. After the coal fire is established and spread throughout the firebox, gently shake the grate until ashes fall in the ash pan area. Add larger amounts of coal to build up the coal bed.

5. Allow your Energy King to operate with drafts on for approximately 15 minutes or until fresh coal ignites. When the coal is properly ignited, adjust the thermostat accordingly.

6. Check the fire periodically to be sure it is spreading throughout the coal bed.

Recharging

Gently shake grates down. When recharging, fresh coal tends to give off large quantities of volatile gas. This gas may accumulate and possibly ignite causing a backpuff. To reduce backpuffing, partially open the fire door for 15 to 20 seconds before opening fully.

Spread fresh coal evenly over existing coal, leaving some hot coals exposed in the center of the firebox. Be careful not to smother your existing coals. Never allow coal to build up above the top of the firebrick. If the coal fire dies down before recharging, a fresh supply of kindling may have to be added.

Bituminous Recharging

Because bituminous coal has a higher percentage of sulfur and a lower percentage of fixed carbons than anthracite, recharging should be as follows:

Gently shake down grates. Push the hot coals to the rear of the firebox and position fresh coal on the grate in front of the banked coal. As the fresh coal begins to burn, wood may be added to the top of the coal.

Banking

Banking allows a person to recharge in such a manner as to retain a hot coal bed throughout the night. Approximately one hour before retiring for the night, push the coals to the rear of the firebox with the coal tapered down in the front. Add a new layer of coal. Always leave some hot coals exposed in the front. This allows more coal to be added to the firebox.

Maintenance

Before first firing each new heating season, check all installations and accessories to ensure a safe burning process. The chimney and connectors should be free of any creosote buildup prior to the beginning of the heating season.

All ashes should be removed from the Energy King at the end of the heating season. Any ashes left in the Energy King will draw moisture during the summer and have a corrosive effect on metal and cast iron parts.

Creosote – Formation and Need for Removal

When wood is burned slowly, it produces tar and other organic vapors that combine with expelled moisture to form creosote. The creosote vapors condense in the relatively cool chimney flue of a slow burning fire. Consequently, creosote residue accumulates on the flue lining. When ignited, this creosote makes an extremely *"hot hot"* fire.

The chimney connector and chimney should be **inspected at least twice monthly** during the heating season to determine if a creosote buildup has occurred. If creosote has accumulated, it should be removed to reduce the risk of a chimney fire.

Ash Removal

Check ashes daily. Remove ashes as needed.

CAUTION

NEVER LET ASHES BUILD UP TO GRATE LEVEL. THIS WILL GREATLY REDUCE THE LIFE SPAN OF YOUR GRATE.

Ash pan can get very hot. Handle with care.

Ashes should be placed in a metal container with a tight fitting lid. The closed container of ashes should be placed on a non-combustible surface. If the ashes are disposed of by burial in soil or otherwise locally dispersed, they should be retained in the closed container until all cinders have thoroughly cooled. Coal ash must be disposed of in a municipally designated area.

Proven Fact: Small red embers buried in ash cans stay red-hot for days. Ashes are a good thermal insulator and keep enough oxygen away so the embers do not burn out.

Troubleshooting Guide

Unit does not burn properly

1. Check the wood; it must be dry. If moisture is sizzling out the end, the wood is too wet.
2. Test the draft. It should be .05/.06 (inches of water column).
3. Check to make sure the flue is not obstructed. Also, check the baffle area in the unit for excessive ash buildup.
4. Check the ash drawer. Empty the drawer if it has too much ash in it. Combustion air needs to come up through the grates on Energy King heating appliances to feed the fire.
5. Check the airflow in the room. If it is too airtight, the unit cannot get enough combustion air to burn properly. You may need to bring outside air to the furnace or stove.
6. Check the chimney and stovepipe. They need to be airtight to make the unit draft properly.
7. Check that only one appliance is hooked to the chimney.
8. Check the chimney for a downdraft. A cold chimney will keep flue gases from rising up the chimney. Proper insulation of the chimney and/or installing a stainless steel liner sized for the unit may remedy the problem.
9. Check your chimney for downdraft caused by taller surrounding trees or buildings. The chimney may have to be extended or a chimney vent cap installed.
10. Check all gaskets for leaks: Door gaskets, glass gaskets, ash drawer or door gaskets (where applicable).

Unit does not give off enough heat

Is the unit installed correctly?

1. Check to see if the unit has an adequate cold air return or inadequate hot air outlet.
2. Furnace room may be too airtight, inadequate combustion air or return air.
3. Flue draft may be inadequate or too strong - .05/.06 (inches of water column) recommended.
4. Door gaskets may be leaking. In addition, glass gaskets, ash drawers or door gasket should be checked for leakage.
5. Check flue. Make sure it is not obstructed.
6. Check ductwork for leaks, cold and hot air ducts.

Unit is making noise/distribution blower is vibrating

With electrical power disconnected, check the following:

1. Check for loose parts.
2. Is the blower wheel contacting the housing? If so, realign or replace as required.
3. Is foreign material inside the housing?
4. Is there a leak in the ductwork or is there loose ductwork?
5. Does the blower wheel/motor need to be cleaned or serviced?
6. Is the blower wheel set screw loose? If so, secure it properly.

   Maintenance of blower assembly
   After disconnecting the power source,
   a) Remove dirt from blower wheel and housing.
   b) Check tightness of wheel set screw.
   c) Check the wiring to see if it is secure and well insulated.
   d) Lubricate the motor according to the manufacturer's instructions. Remove any excess lubricants.

Blower is not working

1. Check for a blown fuse or open circuit breaker.

2. Insufficient air flow
   a) Motor speed is too low (multi-speed units only).
   b) Leaks in ductwork.
   c) Dampers and/or registers closed.
   d) Obstruction in system.
   e) Clogged filters.

3. Too much air flow
   a) Filters not in place (where applicable).
   b) Motor speed too fast (multi-speed units only).
   c) Registers or grills not installed.
   d) Insufficient static pressure (SP). Check your static pressure (SP) calculations and correct system accordingly.

4. Motor overloaded – System static pressure too low. Check and correct system.

5. Thermostat is not opening damper (or turning on forced draft fan)
   a) Check wall thermostat.
   b) Check the thermostat wires (possible short or broken wire).
   c) Check wire connections.
   d) Make sure heated area is calling for heat.
   e) Check damper assembly so that all parts move freely.
   f) Damper motor or forced draft fan improperly wired – compare wiring on the unit to the schematic in the manual.

6. Excessive creosote
   a) Make sure the unit's smoke pipe is vented into its own proper chimney.
   b) Check length of flue pipe and all connections. Offsets in flue pipe will slow flue gases down causing buildup.
   c) Slow fires with excessive amounts of fuel can cause creosote buildup in smoke pipe and chimney.

Coal fire goes out or does not hold overnight

Check for the following conditions:

1. Poor draft

2. Incorrect damper settings.

3. Improper firing methods for coal being used.

4. More combustion air needed.

5. Coal is not sized to the furnace.

6. Ashes, if allowed to accumulate in the ash pit, will not allow the passage of air for combustion. Keep ash pit clean.

Note: Never stand in front of loading door when opening it. Stand to the side.

Too much draft air will cause clinkering of coal and will waste heat up the chimney. Shut draft down to as low a point as you can and still heat your home.

Frequently asked questions

Q. "Do I operate my stove differently in cold vs. warm weather conditions?"

R. Yes, during the warmer seasons of spring and fall, control the total heat output by limiting the amount of fuel (wood) rather than by closing down the air supply. Make shorter, hot fires using more finely split wood. The actual air supply setting will vary according to your stove instructions, but the fuel loadings will be consistently smaller. Let the fire burn out rather than smolder at low air supply settings. When your home requires more heat, restart the fire with kindling as always, but add smaller fuel loads. This allows your stove to operate at maximum efficiency and with minimum emissions. Avoid the temptation of building a big fire and then starving it for air.

Q. “Is it important to have my stove and chimney cleaned?”
R. Smoke rising through your chimney may condense and build up on the cooler inside walls forming a substance known as creosote. This volatile substance can ignite and burn in the chimney. Many chimneys and installations are unable to withstand these dangerous creosote fires; the results can be tragic.

Q. “How often should I have my chimney inspected and cleaned?”
R. A professional, certified chimney sweep should inspect and clean your flue system regularly. Frequent stove use may require monthly chimney inspection and cleaning, while even minimal use will require annual servicing.

Woodstove connectors (stovepipes) should be checked as often as every 2-4 weeks. Your chimney sweep can show you the proper methods for these more frequent inspections.

Q. “Does it matter what kind of wood I use?”
R. Your fuel supply should consist of a mixture of hardwoods, like maple or oak, and softwoods, such as fir and pine. When first starting your fire, use softwoods. They ignite easily and burn rapidly with a hot flame. Hardwoods provide a longer lasting fire and are best used after preheating the chimney. If hardwoods are unavailable, you can control your fire’s burn rate by using larger pieces of wood.

Q. “Is it important to season wood before burning it?”
R. The seasoning, or drying, process allows most of the natural moisture found in wood to evaporate, making it easier to burn. A properly seasoned log will have 20%-30% moisture content.

Wood only dries from the surface inward; unsplit pieces dry very slowly. To properly season wood, split the logs as soon as possible and stack them in a dry spot for 6-18 months. Pile the wood loosely, allowing air to circulate through the split logs. Hardwoods take longer to dry than softwoods. Humidity and temperature levels also will impact drying time.

Q. “What’s the best way to load wood into my stove?”
R. Avoid placing pieces of wood in parallel directions, where they may stack too closely. Vary the position of the wood in the firebox to maximize the exposed surface area of each piece of wood. Only use wood properly sized for your stove’s fire chamber. Complete wood combustion requires wood (fuel), temperature (heat) and oxygen (air) to burn completely and cleanly.

Q. “Is there anything I shouldn’t burn?”
R. Never burn garbage, plastic, foil, or any kind of chemically treated or painted wood. They all produce noxious fumes that are dangerous and highly polluting.

Six Year Prorated Warranty

RJM Manufacturing, Inc. warrants Energy King Wood/Coal Burning Furnaces to be free from defects in workmanship and materials under normal use and service for a period of six (6) years from the date of purchase, subject to the terms and conditions of this agreement.

Exceptions to the terms are firebrick and gaskets which are expendable and replaceable items; electrical components, gauges, relief valves, and coils, which are covered by the original manufacturer's warranty; and castings in which Energy King warranties for one (1) year under proper use.

An Energy King appliance or any parts or portion thereof, which in the judgment of RJM Manufacturing, Inc., shows evidence of such defect will be repaired or replaced by RJM Manufacturing, Inc., at our option through an authorized dealer provided that the defective part is returned to the dealer, transportation prepaid, within six (6) years from the date of purchase and registration of the warranty. This warranty does not apply to any part that has been altered, tampered with, or has been subject to accident or misuse.

Warranty on an Energy King furnace will be prorated for a period of six (6) years from the date of purchase with proof or purchase.

All transportation charges on warranty appliances and appliance parts submitted for repair or replacement under this warranty shall be paid for the by purchaser; field analysis of condition, removal, and/or replacement of any part or parts thereof are not covered under this warranty.

This warranty does not extend to any heating system or systems to which the appliance may be attached. No warranty is extended to any of the smoke pipes, heat pipes, chimney, hardware, ducting, vents, or other accessories used for installation.

This warranty does not cover part or parts modified, damaged in shipment, improper handling, improper installation, improper operation, abuse, misuse, accident or unworkmanship repairs.

RJM Manufacturing, Inc., is not responsible for installation and will not be liable in any respect under the terms of the warranty for injury or damage to the building structure in which the Energy King has been installed, or to the person or persons and property therein, arising out of the use, or installation of the Energy King appliance. The Energy King must be installed in compliance with the local and state building and fire codes of the area and in strict adherence to the manufacturer's recommendations.

Warranty is limited to Energy King parts only. No other warranty is written, implied or expressed.

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